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Examiners' Report November 2009

GCSE

GCSE Mathematics (1380)

Foundation Calculator Paper (2F)

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November 2009

1. PRINCIPAL EXAMINER'S REPORT – FOUNDATION PAPER 2

1.1. GENERAL COMMENTS

This paper was accessible to most candidates with the majority of candidates attempting all questions.

Candidates appeared to be able to complete the paper in the allotted time.

Candidates should be encouraged to:

- show the substitution stage in their working
- write a probabilities as fractions, decimals or percentages
- use the correct notation for coordinates, i.e. with round brackets
- draw a line of best fit on a scatter graph even when not specifically instructed to do so
- write down the value of each of their trials to at least 1 decimal place.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

This question was done well. The vast majority of the candidates were able to interpret the scales correctly. Common incorrect answers in part (a) were 7.2 and 70.2, and a common incorrect answer in part (b) was 87.

1.2.2. Question 2

Generally this question was not done well. In part (a) a significant number of candidates gave the perimeter as the area and the area as the perimeter. A common incorrect answer in (ii) was 12. In part (b) about a third of the candidates were unable to find the volume of the shape. A common incorrect answer here was 18, which was obtained by calculating $3 \times 3 \times 2$.

1.2.3. Question 3

This question was done well. The vast majority of the candidates were able to read the table correctly for the required information. A common incorrect answer in part (a) was 13.

1.2.4. Question 4

Generally this question was not done well. In part (a) many candidates struggled to write down the names of the 3-D shapes. A common incorrect answer for the cuboid was 'rectangle', and a common incorrect answer for the triangular based pyramid was 'prism'. In part (b) most of the candidates were able to write down the number of faces of the prism, but only half were able to write down the number of edges of the prism. A common incorrect answer here was 6.

1.2.5. Question 5

Generally this question was done well. In part (a) the vast majority of the candidates were able to write down the fraction of the shaded shape. A common incorrect answer here was 3/5. In parts (b) and (c) about three quarters of the candidates were able to shade 0.7 of the shape and write down the percentage of the given shaded shape. A common incorrect answer in part (b) was to shade 0.7 of only one of the squares in the shape. Common incorrect answers in part (c) were 4 and 4/10.

1.2.6. Question 6

Generally this question was done very well. The vast majority of the candidates were able to read the timetable correctly and do the appropriate time calculations. A common incorrect answer in part (c) was 09 85.

1.2.7. Question 7

Generally this question was done well. The vast majority of the candidates were able to score at least one of the marks- usually for observing that one of the bars was unlabelled, and about half the candidates scored both marks. Common unacceptable answer here were, e.g. 'the axes are not labelled *x* and *y*" and "it doesn't give the total number of students".

1.2.8. Question 8

Generally this question was done well. In part (a) most candidates were able to write down the next term in the sequence and explain why, and in part (b) most candidates were able to extend the sequence to the 26th term. A common incorrect answer here was '$n + 4$'.

1.2.9. Question 9

Generally this question was done well. More than three quarters of the candidates were able to write down the correct answers for each of these questions. A common incorrect answer in part (a) was 20, and in part (b) was 6.

1.2.10. Question 10

Generally this question was done well, but in part (b) only about 60% of the candidates were able to identify the prime number from the list, and in part (c) the word 'difference' in the question was clearly an issue for some of the weaker candidates.

1.2.11. Question 11

Part (a) was not done well. Less than half the candidates were able to identify the quadrilateral as a kite. A common incorrect answer here was rhombus. In part (b) the majority of candidates were able to identify the right angle in the diagram, but some incorrectly placed their R by the double hashed line. About three quarters of the candidates were able to give the special name of the angle in the diagram; the most common incorrect answer was 'obtuse'.

1.2.12. Question 12

Part (a) was done well. Most candidates were able to identify the mode from the list. Common incorrect answers were 3 and 4 (presumably the 'median'). Parts (b) and (c) were done quite well. The majority of candidates were able to work out the median in part (b) and the mean in part (c). A significant number of candidates did not show any working for either of these parts. Candidates should be advised to show all stages in the work. Common incorrect answers here were 5 in part (b), and 45 and 38.7(7) in part (c).

1.2.13. Question 13

Part (a) was done well. Most candidates were able to simplify the expression correctly. A common incorrect answer here was $7p^2$. Just under two thirds of the candidates were able to write down the correct answer for part (b), a common incorrect answer here was to leave one of the multiplication signs in the expression. Only the best candidates were able to correctly simplify the expression in part (c). Common incorrect answers here were y^6 and $3y^6$.

1.2.14. Question 14

In part (a) the majority of the candidates were able to work out the angle *x*, but a significant number of these had difficulty in stating the reason accurately. A common insufficient reason here was, e.g. 'angles on a line add to 180°'. In part (b) many candidates were able to work out the angle *y* and give an accurate reason. The most common acceptable reason was, e.g. 'angles in a triangle add up to 180°'. Few candidates gave 'isosceles' as a reason though it was clear from the work that this theorem had been applied.

1.2.15. Question 15

Parts (a) and (b) were generally done well. Most candidates were able to read the required values from the conversion chart. The most common error here was to read the 12 miles from the kilometre axis and the 10 kilometres from the miles axis. In part (c) the majority of candidates were able to change 100 miles to kilometres, usually by converting 10 miles to kilometres and multiplying by 10, though other methods were common and acceptable.

1.2.16. Question 16

Part (a) was done well. Most candidates realised that Aimee received half of the 84 votes. A common incorrect answer here was 180. Part (b) was not done well. Only about a third of the candidates were able to write down Paul's fraction of the votes as 60/360 and then simplify it fully. By far the most common incorrect answers here were 60/100, 3/5 and 1/3.

1.2.17. Question 17

Just over half the candidates were able to score full marks in this question. Most set out their work clearly showing each step in the calculation and working in consistent monetary units, but a significant number of candidates were unable to correctly work out 3/4 of £2.40. A common incorrect answer here was &7.20 (from 3 × £2.40).

1.2.18. Question 18

Just under half the candidates were able to score full marks in this question. A significant number of candidates were confused about the order of operations and/or how to deal with the minus sign. Candidates should be encouraged to show the substitution stage in their working, e.g. 3×2 + 5×−4. A very common incorrect answer here was 3×2 + 5−4 = 6 + 1 (=7).

1.2.19. Question 19

Generally this question was done well. Most candidates were able to use the given exchange rate to convert the money as required. The most common incorrect answers here were based on calculations in which they divided by the exchange rate when they should have multiplied or they multiplied by the exchange rate when they should have divided.

1.2.20. Question 20

Only the best candidates were able to score full marks on this question. In part (a) a significant number of candidates were confused about the order of the operations. A common incorrect answer here was 5.53421... (from 8.7 × 12.3 ÷ 9.5 – 5.73). Many candidates were able to score a mark for either 107.01 or 3.77 seen in the working. In part (b) few candidates were able to round their answer in part (a) to 1 significant figure- even when their answer in part (a) was the much simpler incorrect answer 5.53421... Common incorrect answers here were 28, 28.4 and 28.3.

1.2.21. Question 21

Parts (a) and (b) were generally done well. A common error in part (b) was 33.

Only about 50% of the candidates were able to get part (c) correct. A very common incorrect answer here was 2 (presumably from 10 ÷ 2). In part (c) just over half the candidates were able to subtract 7 from 13 and divide this by 4. The vast majority of candidates did not use algebra to show the stages in their work. A very common incorrect answer here was 5, which came from the calculation '13 + 7 = 20' and '20 ÷ 4 = 5'.

1.2.22. Question 22

This question was done well. In part (a) the vast majority of candidates were able to score full marks for completing the two-way table correctly. In part (b) a significant number of candidates did not give the required probability using the correct notation. A common unacceptable answer here was 79:200. Candidates should be encouraged to write probabilities as fractions, decimals or percentages.

1.2.23. Question 23

This question was not done well. Few candidates were able to draw a correct plane of symmetry for the prism, or indicate such a plane by drawing two adjoining lines. A common answer, which scored one mark, was to draw only side of a plane of symmetry- usually on the sloping face of the prism. In part (b) a significant number of candidates drew a trapezium for the front elevation of the prism, but then went on to draw a rectangle on one of its sides, or add parallel lines to two or more vertices.

1.2.24. Question 24

Just under half the candidates were able to score full marks for this question. The two most popular methods were (i) to work out the cost per kg for each box of soap powder, and (ii) to scale up the cost of the soap powder in the small box to 9 kg. A common error in the first method was to find the correct values 0.86 and 0.85 and then draw an incorrect conclusion from these values; and a common error in the second method was to correctly work out 4 × £1.72 for 8kg of soap powder but then make a mistake in finding the cost of the additional 1kg of soap powder. A common incorrect calculation here was, e.g. '4 × £1.72 = £6.88 + 1.72 = £8.60'.

1.2.25. Question 25

This question was not done well. Few candidates were able to score full marks and more than half were unable to score any marks at all. A common error was to describe this transformation as a combination of transformations- usually a translation and a rotation. Candidates should be encouraged to use the correct notation for coordinates, i.e. with round brackets.

1.2.26. Question 26

Less than half the candidates were able to score any marks in this question. A popular method for finding 17.5% of £360 was to write down 10% of £360, halve this for 5%, and then halve this for 2.5%. This method was generally successful but a significant number of candidates did not than go on to add their £63 to the £360 for the total cost. A similar, but far less successful method, was to write down 10% of £360, halve this for 5%, take a fifth of this for 1%, and then half this for 0.5%. Some popular incorrect answers here were '£360 + 17.5 = £377.50' and '360 + 360/17.5 = £380.57'.

1.2.27. Question 27

Many candidates were able to describe the correlation as negative, but by far the most popular incorrect answer here was positive. In part (b), few candidates drew a line of best fit on the scatter graph, consequently some answers which were just outside the range of acceptable answers were awarded no marks. Candidates should be encouraged to draw a line of best fit on a scatter graph even when not specifically instructed to do so. A common incorrect answer here was 138 (presumably in the belief that the question was asking for the highest point in the scatter graph).

1.2.28. Question 28

This question was done well by many candidates. The most common correct method here was to divide 180 by 9, and then multiply this answer by 4. A very common but incorrect method was to divide 180 by 2, by 3 and by 4, and to conclude that 90 must be the longest length.

1.2.29. Question 29

Only the best candidates were able to score full marks in this question, but about a third managed to score at least one mark. Many candidates showed that they were able to search systematically for the required solution, but some struggled to substitute values for x into the expression either correctly or with the required accuracy. A common error here was to substitute a suitable value for x into x^3 correctly but then get confused about what to do about the $2x$, e.g. $3.8^3 + 3.8 \times 3.8$. Some candidates gave the value of f(3.7) as 58. Candidates should be encouraged to write down the value of each of their trials to at least 1 decimal place.

2. STATISTICS

2.1. MARK RANGES AND AWARD OF GRADE

Unit/Component	Maximum Mark	Mean Mark	Standard Deviation	% Contribution to Award
1380/1F	100	67.4	16.0	50
1380/2F	100	65.0	18.9	50
1380/3H	100	53.0	20.5	50
1380/4H	100	51.8	22.5	50

GCSE Mathematics Grade Boundaries 1380 – November 2009

	A*	A	B	C	D	E	F	G
1380_1F				78	64	51	38	25
1380_2F				78	64	50	36	22
1380_3H	86	70	52	34	20			
1380_4H	88	71	51	32	19			

	A*	A	B	C	D	E	F	G
1380F				156	128	101	74	47
1380H	174	141	103	66	39	25		

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